

REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars:

1. Amendments and Support for Same

By this response, claims 1-17 have been cancelled in favor of new claims 18-38, of which claims 18, 30, and 31 are independent. New independent claim 18 and its dependent claims 19-29 correspond generally to cancelled independent claim 1 and its cancelled dependent claims 2-12, respectively. New claim 30 corresponds generally to cancelled claim 13 in independent form. Hence, claim 30 is a method claim that parallels independent apparatus claim 18. New claim 31 corresponds generally to cancelled claim 15 in independent form. Claim 31 includes all of the features of independent claim 18 and of cancelled claim 15. New dependent claims 32-33 correspond generally to cancelled claims 16-17. New dependent claims 34-38 include features that have been deleted from claims 24, 18, 28, 29, and 19, respectively, in order to overcome the 35 U.S.C. §112, 2nd paragraph, rejections as discussed below.

New claims 18-38 are essentially the original claims rewritten to improve the clarity of the features recited therein.

With respect to claim 18, additional support for the amendments therein can be found in, e.g., Fig. 2 and its description in the specification. No new matter has been added, and approval and entry of the amendments are respectfully requested.

2. Objection to the specification

The examiner objects to the specification because the last sentence in page 13 is incomplete. In response, Applicant has amended the specification to correct a typographical error that cause a comma and the subject "it" following the comma to be omitted.

In addition to correcting the above-mentioned typographical error, Applicant has further amended the specification to provide proper headings for various sections of the specification and to improve the clarity of a number of features described therein to provide more consistency in the usage of terminologies. No new matter has been added.

In view of the amendments to the specification, Applicant respectfully requests reconsideration and withdrawal of the objection to the specification.

3. Objection to the claims

With regard to claims 14-17 being objected to under 37 CFR 1.75(c) as being improper dependent form for failing to further limit the subject matter of a previous claim and to claims 16-17 being objected to as being dependent on claims 15, Applicant has rewritten claims 15 in independent form as new claim 31. As discussed above, original claim 15 has been cancelled accordingly. Original claim 14 has also been cancelled without being rewritten as a new claim.

In view of the amendments set forth above, Applicant respectfully requests reconsideration and withdrawal of the objection to claims 14-17.

4. Claim rejections under 35 U.S.C. §112, 2nd paragraph

With regard to the rejection of claims 2, 7-8, and 11-13 under 35 U.S.C. §112, 2nd paragraph, and in particular with respect to claim 2, the examiner contends that the recitation of both broad and narrower range in the same claim is indefinite. In response, Applicant has rewritten claim 2 as new claim 19 to delete the recitation “in particular is less than 20°C lower than said critical threshold value (TMAX).” This recitation is now recited in a new dependent claim 38. Applicant notes that the recitation “less than 20°C

lower than said critical threshold value” originally cited in claim 2 was a typographical error. As shown in new claim 38, as corrected, this term is now expressed as: “the hysteresis upper temperature limit is less than the critical threshold value by 2°C or less.”

Support for this correct can be found in, e.g., page 4, line 16, and in page 8, line 7 of the original specification.

With respect to claim 7, Applicant has rewritten claim 7 as new claim 24 with the omission of the recitation “namely at least one per minute, and preferably continuously.” New dependent claims 34 and 35 have been added to recite the respective omitted features.

With respect to claim 11, Applicant has rewritten claim 11 as new claim 28 with the omission of recitation “preferably between 2.7 and 3.5.” This omitted narrower range is now recited in new dependent claim 20.

With respect to claim 12, Applicant has rewritten claim 12 as new claim 29 with the recitation “better still between 200°C and 300°C” omitted. This omitted feature of a narrow range is now recited in new dependent claim 37.

With respect to claim 13, Applicant has rewritten claim 13 as new claim 30 in independent form. Claim 30 is an independent method claim that parallels the features recited in independent apparatus claim 18.

In view of the amendments and arguments set forth above, Applicant respectfully requests reconsideration and withdrawal of the §112, 2nd paragraph, rejections of claims 2, 7-8, and 11-13.

5. Rejection under 35 U.S.C. §102(b)

Claims 1, 4-6, and 10 stand rejected under 35 U.S.C. §102(b) as being anticipated by Kobayashi (U.S. 4,662,185). Applicant respectfully traverses this rejection at least for the reason that Kobayashi fails to disclose each and every limitation recited in the rejected claims.

Kobayashi generally describes a compressor 7 with speed control, wherein the speed of the compressor is regulated based on temperature deviations D , as shown in col. 1, lines 46-51 of Kobayashi. Further, to achieve a target temperature (T_S) set by a presetter 2 of a refrigerator, the actual temperature (T_A) in the refrigerator is measured by temperature sensor 1. Then, a control signal (i.e., speed command) to drive the compressor 7 by a certain RPM corresponding to the temperature deviation (D), which is represented by equation $D = T_A - T_S$, is then given by controller 5, as shown in an embodiment of Kobayashi in col. 2, lines 22-35 and in Fig. 4, for example.

Still further, in Kobayashi, the speed regulation is also time dependent. That is, if a temperature deviation D falls within a range from $-D_m$ to $+D_n$, speed control is activated depending on the temperature deviation D is varied by a unit amount ΔD within a time period, as shown in col. 2, lines 53-60, for example.

In contrast with Kobayashi, independent claim 18 of the present invention recites the hysteresis module configured with a hysteresis upper temperature limit, a hysteresis lower temperature limit, and a permitted maximum speed range including a minimum rotational speed and a maximum rotational speed, wherein upon detecting from a temperature sensor that the hysteresis upper temperature limit of an outlet gas has been reached, the hysteresis module is configured to lower the rotational speed of a compressor element by a speed change (i.e., an increment) via a speed controller when a measured rotational speed of the compressor element is in a high speed range approximately at the maximum rotational speed, and wherein upon detecting from the temperature sensor that

the hysteresis lower temperature limit of the outlet gas has been reached, the hysteresis module is configured to increase the rotational speed of the compressor element by a speed change via the speed controller when the measured rotational speed of the compressor element is in a low speed range approximately at the minimum rotational speed.

Further, although not included in the rejection, independent claim 31 (i.e., former claim 15) of the present invention is also patentable over Kobayashi because claim 31 recites all of the features of claim 18 with the addition of the features wherein the hysteresis module is further configured with a memory for storing gas outlet temperature curves representing the outlet temperature as a function of the rotational speed of the compressor element and the hysteresis upper and lower temperature limits, and a speed jump for the rotational speed that is effected when the hysteresis upper or the lower temperature limit is reached.

Still further, unlike Kobayashi's time dependency of the temperature deviation D in the control of speed regulation, the present invention as recited in pending claims 18-38 is not time dependent.

Applicant respectfully asserts that in the rejection the examiner has improperly mischaracterized the invention described in Kobayashi. For example, the examiner contends that the actual temperature (T_A) in the refrigerator of Kobayashi is equivalent to Applicant's claimed outlet temperature T_O . As another example, the examiner mischaracterizes D_m , which is a part of a range of temperature deviation of Kobayashi, as being equivalent to Applicant's hysteresis upper temperature.

Further, while citing T_A and D_m of Kobayashi in the rejection, the examiner selectively improperly ignores features, such as the target temperature (T_S), the equation $D = T_A - T_S$, the temperature deviation D that falls within a range from $-D_m$ to $+D_n$ and that is time dependent, relevant to the function of the invention described in Kobayashi.

Therefore, Applicant respectfully asserts that the examiner has failed to consider the prior art in its entirety as set forth in MPEP 2141.02(VI), and that the reliance on Kobayashi in the rejection is further improper.

Consequently, since each and every feature of the present claims must be disclosed or taught in Kobayashi, as is required by MPEP Chapter 2131 in order to establish anticipation, the rejection of claims 1, 4-6, and 10, under 35 U.S.C. §102(b), as anticipated by Kobayashi is improper.

In view of the amendment and arguments set forth above, Applicant respectfully requests reconsideration and withdrawal of the §102(b) rejection of claims 1, 4-6, and 10.

6. Conclusion

In view of the amendments to the claims, and in further view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is requested that claims 18-38 be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the Applicant's attorney, the Examiner is invited to contact the undersigned at the numbers shown.

Respectfully submitted,

Customer No. 23364
BACON & THOMAS, PLLC
625 Slaters Lane, Fourth Floor
Alexandria, Virginia 22314-1176
Phone: (703) 683-0500


ERNEST KENNEY
Attorney for Applicant
Registration No. 19,179